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Model space truncation in shell-model fits[1] CALVIN JOHNSON, Dept. of Physics, San Diego State University, GEORGE BERTSCH, Institute for Nuclear Theory and Dept. of Physics, University of Washington — The interacting shell model with fitted interactions has been a powerful predictive tool of nuclear structure theory, but there has been little study of the error associated with truncation of the shell model spaces. We present a model study of spectra in the *sd*-shell nuclei to address this question. Carrying out a truncation with a model Hamiltonian we find that the binding energies are strongly affected and the excitations less so, by an order of magnitude. We then refit the matrix elements of the two-particle interaction to compensate for the space truncation, and find that it is easy to capture 90% of the binding energy shifts by refitting a few parameters. Numerically, the rms initial error associated with our Hamiltonian is 3.4 MeV and the remaining residual error is 0.16 MeV, to be compared with the 0.11 MeV residual error in the application to experimental data.

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